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| EXAMINER | |
|---|---|
| RUSSEL, JEFFREY E | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/583,202 | HAMPSON ET AL. | |
| | Examiner | Art Unit | |
| | Jeffrey E. Russel | 1654 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,18,20,23,24,27 and 31-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,18,20,23,24,27 and 31-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Applicant's election of the inventions of Groups I and VII in the reply filed on November 1, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election with traverse of the species of SEQ ID NO:2 in the reply filed on November 1, 2007 is acknowledged. The traversal is on the ground(s) that searching all of the species would not be unduly burdensome. This is not found persuasive because each sequence will require separate sequence searches, which constitutes an undue burden on the Office.

The requirement is still deemed proper and is therefore made FINAL.

2. The amendment to the Related Applications section of the specification is not in compliance with 37 CFR 1.121(b)(1)(ii) because the amendment does not accurately mark all changes being made to the paragraph relative to the immediate prior version of the paragraph. Note, for example, that the word "on", which occurred after "PCT/AU2004/001783" has been omitted without marking using strike-through. Note also the insertion of a reference to the Australian Application No. without marking using underlining. Finally, the amendment would have benefited by including a page and line number with the amendment instruction, as was done with the preliminary amendment.

The Listing of Claims submitted with the response filed May 21, 2008 is not in compliance with 37 CFR 1.121(c)(1) because the Listing does not present all of the claims. Claims 25-26 (Cancelled) are not mentioned in the Listing.

Any future amendments should be carefully checked to ensure compliance with the amendment rules.

3. The Sequence Listing filed May 21, 2008 has been approved by STIC for matters of form.

4. The amended abstract of the disclosure filed May 21, 2008 is objected to because it was not submitted as a separate sheet. Correction is required. See 37 CFR 1.72(b) and MPEP § 608.01(b).

5. Claims 31 and 32 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Independent claim 18 is limited to administering a polypeptide comprising the amino acid sequence of SEQ ID NO:2. Dependent claims 31 and 32, however, recite and embrace administering a polypeptide comprising a fragment of the amino acid sequence of SEQ ID NO:2. Accordingly, dependent claims 31 and 32 embrace administering polypeptides which are not embraced within the scope of the independent claim, and dependent claims 31 and 32 are therefore improper dependent claims.

6. The amendment filed May 21, 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendment to the Sequence Listing filed May 21, 2008 deleting the Glx residue from the C-terminus of SEQ ID NO:2, and the amendment to the paragraphs at pages 13, 14, 58, and 59 of the specification making corresponding changes to the length of the polypeptide of SEQ ID NO:2 and to the length of the coding sequence for the polypeptide of SEQ ID NO:2, are new matter. The disclosure of the

invention does not recite a polypeptide of SEQ ID NO:2 comprising only 563 amino acids and not comprising a C-terminal Glx residue, and does not recite a coding sequence of only 1689 nucleotides. Applicants state in their Remarks that this change is intended to correct "the inadvertent error in SEQ ID NO:2 as originally filed". However, errors in the original disclosure can be corrected only where: (1) one skilled in the art would recognize the existence of the error; and (2) one skilled in the art would also recognize the appropriate correction for the error. See MPEP 2163.07(II), first paragraph (Rev. 6, Sept. 2007). Applicants have provided no argument or evidence which explains how or why, when one skilled in the art views the original disclosure of the invention, he would recognize that SEQ ID NO:2 as originally disclosed is incorrect, and that the sequence should be corrected by omission of the C-terminal Glx residue.

Applicant is required to cancel the new matter in the reply to this Office Action.

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1, 18, 20, 23, 24, 27, and 32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In view of the amendment to the Sequence Listing filed May 21, 2008, the claims now recite a polypeptide comprising 563 amino acids and not comprising a C-terminal Glx residue, and the administration thereof. There is no original disclosure supporting such a polypeptide, for the reasons set forth in the new matter objection made in section 6 above.

9. Claims 31 and 33-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no original disclosure supporting the recitation of a polypeptide comprising an amino acid sequence corresponding to amino acid residues 305 to 563 of SEQ ID NO:2, as occurs in new claims 31 and 33-35. There is no literal support in the original disclosure for this polypeptide. Applicants point to Example 3 of the specification, and its disclosure of $His_6$-Bpmp-72C and pTrc-Bpmp-72C, as supporting the newly claimed polypeptide. However, Applicants have provided no explanation as to how this disclosure translates to a polypeptide beginning at residue 305 and ending at residue 563 of SEQ ID NO:2.

10. Claims 1, 24, and 27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated polypeptide comprising SEQ ID NO:2 or for the isolated polypeptide corresponding to the 34 kDa C-terminal portion thereof disclosed in Example 3, methods of treating a disease associated with Brachyspira species using the same, and compositions comprising the same, does not reasonably provide enablement for polypeptides comprising fragments of SEQ ID NO:2, e.g., comprising SEQ ID NOS:3-22, for peptides which are at 90% homologous to SEQ ID NO:2 or its fragments, or for methods of using the same. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. Factors to be considered in determining whether a disclosure meets the enablement requirement of 35 U.S.C. 112, first paragraph, have been described in In re Colianni, 195 USPQ 150 (CCPA 1977)

and have been adopted by the Board of Patent Appeals and Interferences in Ex parte Forman, 230 USPQ 546 (BPAI 1986). Among these factors are: (1) the nature of the invention; (2) the state of the prior art; (3) the relative skill of those in the art; (4) the predictability or unpredictability of the art; (5) the breadth of the claims; (6) the amount of direction or guidance presented; (7) the presence or absence of working examples; and (8) the quantity of experimentation necessary. With respect to (1), the nature of the invention is an isolated outer membrane protein of Brachyspira pilosicoli, fragments and/or homologues of the same, and methods of using the protein, fragments, and/or homologues to treat diseases associated with Brachyspira species. With respect to (2), there have been few attempts to control infections by B. pilosicoli, and one previous attempt using a vaccine failed to provide protection. See Applicants' specification at page 2, lines 22-32. With respect to (3), the relative skill of those in the art is high. With respect to (4), the predictability of the therapeutic arts in general is low. In view of the failed attempt at vaccination discussed above, the predictability of treatment of Brachyspira infections in particular appears to be low. With respect to (5), the breadth of the claims is relatively large. The claims embrace polypeptides which are fragments comprising as few as six amino acids of the protein (Applicants' SEQ ID NOS:10, 16, and 22 consist of only six of the 564 amino acids present in the intact protein), and embrace polypeptides comprising amino acid sequences which are 90% homologous to Applicants' SEQ ID NOS:2-22 (see instant claim 27). With respect to (6), Applicants have not identified the epitope and/or epitopes present in the protein of SEQ ID NO:2 which are necessary for successful treatment of diseases associated with Brachyspira species. No structure-activity relationship is disclosed in the specification. With respect to (7), the activity tests disclosed in the specification are limited to

use of the intact 72 kDa protein and to the C-terminal fragment tested in Example 3. There is no disclosure of any testing of any other fragments or homologues for activity in treating diseases associated with Brachyspira. With respect to (8), in view of the lack of predictability in the art, in view of the relative breadth of the claims, and in view of the lack of any disclosed structure-activity relationship and the lack of any disclosed testing of fragments or homologues of the intact protein, essentially random testing of all possible fragments and homologues would be necessary in order to determine activity and ability to treat diseases involving Brachyspira activity. Such random testing constitutes undue experimentation. When the above factors are weighed, it is the examiner's position that one skilled in the art could not practice the invention without undue experimentation.

11. Claims 1, 18, 20, 24, 27, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by the Tenaya et al article (J. Med. Microbiol., Vol. 47, pages 317-324) in view of Applicants' admission of the prior art at page 1, lines 20-21, of the specification. The Tenaya et al article teaches a 72 kDa outer envelope protein isolated from Serpulina pilosicoli. The protein is purified, combined with a carrier such as PBS and Freund's incomplete adjuvant, and administered to rabbits in order to raise antibodies. See, e.g., the Abstract; and page 319, column 2, first and second paragraphs. Applicants' specification at page 1, lines 20-21, shows that "Serpulina pilosicoli" and "Brachyspira pilosicoli" are synonyms. In view of the similarity in source, location within the bacteria, molecular weight, and antigenicity between the protein of the Tenaya et al article and Applicants' claimed polypeptide, the former is deemed to be the same as the latter, and the former inherently will have the same amino acid sequence as the latter. Sufficient evidence of similarity is deemed to be present between the protein of the

Tenaya et al article and Applicants' claimed polypeptide to shift the burden to Applicants to provide evidence that the claimed polypeptide is unobviously different than the protein of the Tenaya et al article. Note that further characterization of a known protein, e.g., determination of the protein's amino acid sequence, does not impart patentability to claims drawn to the known protein. Note also that because the protein of the Tenaya et al article is deemed inherently to comprise Applicants' SEQ ID NO:2, it will also inherently comprise fragments of Applicants' SEQ ID NO:2, i.e. it will comprise Applicants' SEQ ID NOS:3-22 and fragments thereof. Because the protein of the Tenaya et al article is administered to rabbits in which it acts as an antigen and raises antibodies, inherently the protein of the Tenaya et al article will vaccinate and prevent diseases including intestinal spirochaetosis in the rabbits to the same extent claimed by Applicants. Note that Applicants use the term "treatment" generically to encompass both prophylaxis and therapy of a disease. See, e.g., page 1, lines 7-9, of the specification. Again, sufficient evidence of similarity is deemed to be present between the method of the Tenaya et al article and Applicants' claimed method to shift the burden to Applicants to provide evidence that the claimed method is unobviously different than the method of the Tenaya et al article.

12. Applicant's arguments filed May 21, 2008 have been fully considered but they are not persuasive.

The enablement rejection is maintained with respect to instant claims 1, 24, and 27, which recite fragments of SEQ ID NO:2. Even for claims drawn to a product, 35 U.S.C. 112, first paragraph, requires the disclosure of an enabled use for the claimed product. It is not sufficient for the specification solely to disclose what the product is and how to make the product. Even in view of the disclosed and claimed test for establishing activity for the claimed

polypeptides, one skilled in the art is still reduced essentially to random testing of all possible fragments and homologues of a large protein in an unpredictable art in order to determine whether or not the fragments and/or homologues have suitable activity. Such random testing constitutes undue experimentation. The rejection sets forth a prima facie case of non-enablement.

The anticipation rejection over the Tenaya et al article (J. Med. Microbiol., Vol. 47, pages 317-324) is maintained. Applicants are correct that the rejection is based upon inherency. Note that in order to establish anticipation on the basis of inherency, the prior art needs to teach the same product which is claimed by Applicants, and needs to teach the same process which is claimed by Applicants. However, the prior art does not need to teach the same product and process using the same terminology chosen by Applicants to characterize their invention. See In re Skoner, 186 USPQ 80, 82 (CCPA 1975). Applicants and the examiner agree that the Tenaya et al article does need to teach the same isolated polypeptide as is claimed by Applicants in order to anticipate Applicants' claims. In view of the evidence of similarity between the Tenaya et al article and Applicants' claimed invention, the Tenaya et al article is deemed, prima facie, to teach the same isolated polypeptide as is claimed by Applicants. However, the Tenaya et al article does not need to disclose an amino acid sequence for their 72 kDa outer envelope protein in order to anticipate Applicants' claims. Assuming that the polypeptides are the same, then the exact amino acid sequence of the polypeptide is merely an alternative means for describing the same polypeptide, and does not constitute a basis for patentability. Of course, if Applicant were to demonstrate that the 72 kDa outer envelope protein of the Tenaya et al article does differ in amino acid sequence from Applicants' SEQ ID NO:2 (and from the claimed fragments and/or

homologs thereof), this would constitute evidence rebutting the prima facie case of anticipation. However, no such evidence is yet of record. (The Tenaya et al article need not disclose a nucleotide sequence encoding Applicants' SEQ ID NO:2 in order to anticipate Applicants' claims, because Applicants do not claim a nucleotide sequence or a method of using a nucleotide sequence.)

The rejection sets forth factual and/or technical reasoning which supports the prima facie conclusion that Applicants' method claims are anticipated by the Tenaya et al article: Because the same active agent is being administered to the same patient according to the same method steps, it can reasonably be concluded that the same results will occur in the Tenaya et al article as are claimed by Applicants.

Applicants contend that the Tenaya et al article itself is non-enabled; however, Applicants have not satisfied their burden of demonstrating that the reference is non-enabled. See MPEP 2121. Applicants contend that the Tenaya et al article is non-enabled because it does not disclose a nucleotide or protein sequence. However, the lack of disclosure of a nucleotide or protein sequence is irrelevant to the issue of enablement with respect to the Tenaya et al article, i.e. whether the Tenaya et al article teaches an isolated polypeptide which is the same as that claimed by Applicants. A particular name or descriptive language is not a prerequisite to making and using a polypeptide. Applicants contend that the Tenaya et al article does not even disclose a pure protein. Regardless of whether this assertion is true, the assertion is irrelevant to the instant claims, which do not require a pure polypeptide. Applicants' product claims only require an isolated polypeptide, and Applicants' method claims do not set forth any limitations as to the

purity of the polypeptide. Patentability must be based upon claimed, not unclaimed, differences over the prior art.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey E. Russel at telephone number (571) 272-0969. The examiner can normally be reached on Monday-Thursday from 8:00 A.M. to 5:30 P.M. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Cecilia Tsang can be reached at (571) 272-0562. The fax number for formal communications to be entered into the record is (571) 273-8300; for informal communications such as proposed amendments, the fax number (571) 273-0969 can be used. The telephone number for the Technology Center 1600 receptionist is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffrey E. Russel/
Primary Examiner, Art Unit 1654

JRussel
July 22, 2008